Premiere Issue

COMPACT disc Interactive

CD-I NEWS

Issued Monthly for the Consumer Electronic, Entertainment, Publishing, Information, and Education Industries

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HIGHLIGHTS

- **CD-I and CD-ROM** are two completely different applications of Compact Disc technology. CD-I applications will focus on the consumer-oriented mass market, while CD-ROM will make possible special applications for the business market. (p. 1)
- **Haines Gaffner, publisher of CD-I News**, discusses why LINK Resources is launching this new publication. (p. 2)
- **High Sierra Group** presented to NISO standards committee new CD-ROM format proposal incorporating Philips/ Sony CD-I standards -- thereby taking a major step towards ensuring compatibility between the two technologies. (p. 3)
- **Microsoft** announced new MS-DOS operating system permitting easy access to CD-ROM players, clarifying strategy for both CD-ROM and CD-I. (p. 4)
- **A.I.M.'s VP of Marketing, Emiel Petrone**, traces the connection between the spectacular success of Compact Disc-Digital Audio and the promise of CD-I, and also hints at the innovative CD-I programming on the horizon. (p. 8)
- **Evolution of CD-I** pinpoints the development of Philips and Sony in their attempts to bring CD-I technology into the home. (p. 12)

THE DIFFERENCES BETWEEN CD-I AND CD-ROM

Never underestimate the important differences between Compact Disc-Read Only Memory and Compact Disc-Interactive. More to the point, don't forget the critical similarities and direct relationship between Compact Disc-Digital Audio and Compact Disc-Interactive, CD-Audio's multimedia extension. To grasp this distinction is to take a giant step toward understanding the potential of CD-I in the consumer marketplace.

You hear the phrase "Compact Disc-Interactive." You should immediately think consumer market, multimedia (video, audio, text, graphics, computer programs) -- a consumer electronics "appliance," hardware and software specification, and available in 1987.

You hear "Compact Disc-Read Only Memory." You should think business market, computer peripheral, full-text databases, barebones software specification, and products available right now.

It's that easy, isn't it? Couldn't anyone tell the difference?

Early evidence from the marketplace indicates more confusion breaks through the clouds every day. *(continued on page 10)*

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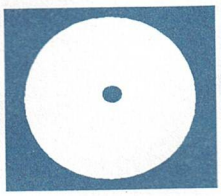

LETTER FROM THE PUBLISHER

Confusion is the enemy of any new technology. Confusion can throw entire corporations off-course, onto the wrong tangent, down dark alleys leading to dead ends. Nothing is harder to come by in a new industry than accurate, timely information -- the enemy of confusion.

LINK Resources is launching CD-I News now to end the confusion in the Compact Disc-Interactive industry, and to serve one of the most exciting consumer technologies ever invented.

Our task will not be easy. We must provide useful and comprehensible information to executives in the entertainment, information, publishing, database, personal computer, and education industries. We must make it clear that CD-I is the logical mass-market multi-media extension of CD-Digital Audio, one of the most spectacular success stories in all of consumer electronics. We must become the "newsletter of record" for this industry.

Above all, we must help our readers keep their focus on CD-I software -- the programming that will drive this industry. In this issue, our interview with Emiel Petrone, vice president of marketing and public relations for American Interactive Media, should stir the imagination of prospective content providers. Announcements, also profiled in this issue, hint at the excitement promised by the CD-I industry in the near future.

CD-I News will be marketed and distributed to interested executives worldwide. If we are to be successful, we need to hear from you -- your Letters-to-the-Editor, your opinion pieces, your leads and feedback. Only then can LINK be certain we have ended the confusion and done justice to Compact Disc-Interactive, an idea whose time has come.

Sincerely,

Haines Gaffner

Haines Gaffner

President, LINK Resources

CD-I NEWS

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WHAT DO YOU THINK?

The editors of CD-I News welcome letters to the editor, submissions for opinion pieces, clippings of interesting articles, news tips, and any relevant information about this new industry.

Please mail your letters, comments, and suggestions to:

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IN FORTHCOMING ISSUES

- **CD-I Timetable**--When will product be on the market?
- **Interview with Sony** representative on Sony's CD-I plans.
- **CD-I video specifications.**
- **Conference Highlights:** MicroTrends, Electronic Publishing, and others.
- **The view of the publishing industry** on CD-I.
- **Description of Microware and OS-9.**
- **CD-I features.**

LINK Resources acknowledges the financial support of N.V. Philips and other companies involved in this emerging industry in the introduction of CD-I News, and invites additional corporate sponsorship.

Annual individual subscription for 12 issues is $195, or the equivalent in your local currency at the time of invoicing.

NEWS

HIGH SIERRA GROUP AGREES ON CD FILE FORMAT

"The High Sierra proposal incorporates the needs and concerns of the CD-I document."

The High Sierra Group, an ad hoc assemblage of CD-ROM vendors and manufacturers, successfully incorporated Compact Disc-Interactive specifications into its CD file format recommendations to the National Information Standards Organization (NISO) and the European Computer Manufacturers Association (ECMA). The de facto standard ensures that most CD-I discs will be played on CD-ROM disc drives, and that most CD-ROM discs will be read by CD-I players. Formal NISO and ECMA reviews -- and a final vote-- will take at least a year.

The High Sierra Group -- hardware and software vendors like Digital Equipment Corporation, Reference Technology, Cuneiform Optical Publishing, and TMS, Inc. -- was an attempt to create a de facto CD-ROM file format standard without waiting for the laborious official standards-making process to reach fruition.

The announcements of the Philips/Sony CD-I specifications just prior to the Microsoft CD-ROM conference in March caused the High Sierra Group to reconfigure their recommendations to ensure CD-ROM file format compatibility with CD-I. The long term gain has been far more significant: a large degree of compatibility between CD-I and CD-ROM discs in the final High Sierra Group recommendation just issued.

Steve Yelick of Cuneiform Optical Publishing, a member of High Sierra:
Philips, Sony, and Microware [developer of the CD-I OS-9 operating system] became an integral part of the High Sierra Group. The proposal very much reflects that. There were some things...that we felt weren't important but they felt were absolutely necessary for a real-time environment [like CD-I]. Before, the High Sierra standard was based on the Intel processor, but because of CD-I it's now based on both the Motorola 68000 processor and the Intel processor [for the IBM PC]....The High Sierra Group was as successful as it could be.

Bill Zoellick, Manager of Software Research For TMS, Inc., and also a member of High Sierra:
The impact of CD-I was primarily positive. The High Sierra proposal incorporates the needs and concerns of the CD-I document. Everyone made an effort to ensure compatibility.

A confidential High Sierra source who requested anonymity:
It was both a learning session and also a compromise. Everyone present had their own ideas. The goal was to decide the format of the files on a disk....People got tired of arguing about something and that's the way things got decided.

Howard Turtle, Director of Technical Planning at OCLC, Inc., and a member of the NISO EE committee:
By and large it's a good recommendation. There are a number of minor things that have to be cleared up. We have officially decided to consider it as a proposal for a standard.

NISO's Standards Committee EE distributed an "annotated version" of the High Sierra draft to its full membership in July, when they also reviewed the latest developments of its European counterpart in the standards-making process, the ECMA organization. The goal is to establish a common international standard for a CD-ROM file format, one that will have compatibility with CD-ROM.

At a September meeting in New York, NISO formally discussed the High Sierra Group recommendations.

Martin Hensel, chairperson of NISO:
We have identified areas [in the High Sierra recommendation] where there are inconsistencies. They are not a big deal, it's just that we are now benefitting from practical experience with the technology. We're anticipating six to twelve substitute paragraphs within the original... It should be completely consistent with CD-I.

Unanimity among the NISO members is not necessary for ratification. NISO's Patricia Harris told CD-I News that the High Sierra draft will be circulated among the membership for balloting and "a concurrent public review." NISO is officially accredited by the governing body in the USA, the American National Standards Institute (ANSI). *(continued on page 7)*

NEWS

MICROSOFT'S CD-I STRATEGY

At the annual Sicob computer trade show in Paris during mid-September, Microsoft Corporation announced plans to develop a new version of its popular MS-DOS operating system. The new system will permit IBM PCs and compatible personal computers access to CD-ROM players via MS-DOS commands. The new MS-DOS will implement standards recommendations of the High Sierra Group [see article in this issue of CD-I News].

Microsoft's new announcement is in line with the strategy outlined by Tom Lopez, vice-president for CD-ROM, at the Information Industry Association West conference on compact disc technology in July. Lopez said: "Our interest is in both [CD-I and CD-ROM] markets." Microsoft sees CD-ROM as "a market for today" -- meaning 1987, with CD-I to follow in the consumer market. Lopez adds:

[Since] a whole new class of applications will be possible ... the challenge will be learning how to combine skills that exist in other areas. It is our intention ... to provide the system software link. ...We can do a lot of pre-processing. We can do a lot of work for the end-user. A good chunk of our disc should be devoted [to making things easier for the end-user].

With regard to other pc systems, Microsoft's intentions were clarified by Raleigh Roark, director of research, CD-ROM Division:

Don't forget the top-selling applications for the [Apple] Macintosh are Microsoft software -- and the Mac doesn't run under MS-DOS, either. [The MAC, in fact, utilizes the same Motorola 68000-family microprocessor as CD-I.] We develop for everything. This [CD-I] isn't really competing with MS-DOS. With our applications software, we'll try to make money wherever we can. We won't turn up our noses at any opportunity.

The news from Microsoft has to be considered encouraging for the CD-I arena. For CD-I to fully prosper, the content providers of the information and entertainment industries need to form a more perfect union with the creative whizzes of the personal computer software industry -- with companies like Microsoft.

DEC ENDS CD-ROM SOFTWARE PUBLISHING INITIATIVE

DEC has decided to "stick to its knitting and try to do what we do best."

Digital Equipment Corporation felt there was only one way to build the software base for its CD Reader product -- to enter the CD software publishing business directly. Now that initiative has been abandoned: DEC has decided to "stick to its knitting and try to do what we do best." The DEC CD experience is a valuable and pointed lesson for any CD-I hardware vendor trying to create a market by direct involvement in software development.

DEC had few alternatives initially because it wanted to play an important and pioneering role in CD-ROM product development. To do so, the hardware vendor took the unusual step of becoming a publisher of discs with data provided by the National Technical Information Service, Engineering Information, Inc., Chemical Abstracts, and nine other business-oriented databases.

The DEC-as-publisher posture had begun to cause ambivalence among other publishers who were potential CD-ROM data providers themselves. It was becoming unclear whether DEC was a potential ally to these prospects or a direct competitor.

DEC will continue to support CD-ROM products based on its Unifile operating system, and also expects to fully support the High Sierra Group's proposal to the National Information Standards Organization (NISO) and the European Computer Manufacturer's Association (ECMA).

NEWS

THE "AIM" OF A.I.M.: PHILIPS, POLYGRAM

JOINT VENTURE TO DEVELOP CD-I SOFTWARE

"AIM's mission is to establish joint venture relationships with companies that will provide software for the CD-I system."

As American Interactive Media goes, so goes Compact Disc-Interactive. The joint venture between two sides of N.V. Philips -- Philips and PolyGram Corp. -- will try to fill CD-I's black hole: the lack of CD-I multimedia programming. The establishment of AIM, and analogous Philips/PolyGram organizations in Europe and Japan, is evidence that Philips is doing everything possible to develop a market for this new industry.

Philips International and PolyGram International formed AIM in April to "*spearhead the development of software for the revolutionary new Compact Disc-Interactive System.*" Gordon Stulberg, president of PolyGram Corporation, USA, is also chairman and chief executive officer of the new entity. Dr. Bernard J. Luskin, formerly executive vice president and treasurer of the American Association of Community and Junior Colleges, has been named president and chief operating officer. Emiel N. Petrone was named vice president for marketing and public relations; he remains senior vice president, Compact Disc, for PolyGram Records. AIM is based in Los Angeles.

AIM CEO Gordon Stulberg:

AIM's mission is to establish joint venture relationships with companies that will provide software for the CD-I system. Through the auspices of Philips and PolyGram, and with a highly knowledgeable staff of executives... AIM is well qualified to provide technical expertise and access to production facilities and distribution channels.

CD-I represents the ultimate Compact Disc system and should benefit from the high level of consumer awareness and acceptance enjoyed by Compact Disc-Digital Audio, especially because the new generation of CD-I players will be compatible with existing audio Compact Discs.

AIM President Dr. Bernard Luskin:

CD-I opens the window to the future for programming involving experiences and discovery. The CD-I specification enables creative publishers and content providers to make full use of the awesome information storage capacity and inherent flexibility of the Compact Disc format.

The CD-I disc thus is a true multi-function, multi-purpose carrier for entertainment, education and training, and professional and industrial applications. More importantly, all of the information can be accessed by the user in an interactive fashion.

AIM faces the imposing task of convincing major players in diverse industries -- entertainment, personal computer, publishing, education -- to commit joint venture funding to CD-I software-development projects for the expected introduction of CD-I players in 1987.

In the coming months, CD-I News will be keeping a close watch on the joint-venture progress of AIM. Will publishers commit to joint ventures? Do they think CD-I is the future of multimedia consumer electronics? Are they willing to put their money where their mouths are -- as Philips and PolyGram have done? Software is critical to the successful introduction of this technology, and AIM can't do it alone. ⊙

WORLD REPORT

EUROPEAN PERSPECTIVE

Compact disc technology in Europe is seen either as Compact Disc-Audio or CD-ROM, with considerable confusion as to where CD-I fits into the spectrum. Apart from specialist periodicals serving the library and electronic publishing markets, published articles on optical disc publishing in newspapers and the computer press have focused almost entirely on the disc's memory size and have failed to grasp the opportunities and problems associated with the new medium.

During the first six months of this year there have been a multitude of conferences and seminars on optical disc publishing, but without exception the emphasis of the papers has been totally on CD-ROM. In terms of press attention, it seems as if Digital Audio Tape has received more coverage than CD-I, and this too adds to the confusion about the future of consumer-based optical disc systems. To complete a depressing picture, Philips itself presents a confusing set of signals about its intentions. An internal Philips newsletter on CD-I, subsequently made available to some people in this industry, has the front page heading "CD-I: A complete standard dramatically impacting the evolution of electronic publishing on interactive electronic media." To most European publishers "electronic publishing" is still regarded as online database publishing, and so these publishers naturally see CD-I as a competitor to CD-ROM -- and not a complementary medium.

The problem facing Philips, Sony, and other industry participants is to dispel the confusion, and this may not be an easy task. Conferences and seminars will help, but in the end pilot projects with commercial potential are going to be needed.

INTERNATIONAL INITIATIVES FOR CD-ROM STANDARDS

The formation of European Interactive Media (E.I.M.), a joint venture of Philips and PolyGram, was announced in London on September 30.

A report based on the activities of the Technical Committee of the Optical Disc Forum has been compiled by Julie Schwerin (InfoTech, USA) and Tony Hendley (CimTech, UK). The 140-page report is divided into the following sections:

- Introduction to CD-ROM and CD-ROM Standards
- Evolution of the CD-ROM Standards
- High Sierra CD-ROM Standard Proposal
- European Perspective
- Conclusions and Recommendations

Appendices include the High Sierra Group working paper and a bibliography. The report has a three page section on CD-I standards, providing a realistic appraisal of CD-I prospects. Especially valuable is the section, "European Perspective," which covers: input provided to the High Sierra Group; results of a poll of major European information providers and hardware/software vendors on the standard; Technical Committee assessment of draft standard; and an identification of issues arising from the draft. The report is available through Learned Information, Ltd.

The formation of European Interactive Media (E.I.M.), a joint venture of Philips and Polygram, was announced in London on September 30. Byron Turner was appointed the president of E.I.M., and Gordon Stulberg was named chairman/CEO of the company. Gordon Stulberg is currently also the chairman/CEO of A.I.M. We plan to interview Byron Turner in the next issue of CD-I News.

WORLD REPORT

OPTICAL DISC FORUM

Future issues of CD-I News will cover CD-I developments in Europe, Japan, and the rest of the world.

The Optical Disc Forum was set up at the end of 1985 by the United Kingdom publishing and conference company, Learned Information Ltd. Learned Information organizes the Online meetings in London and New York each year, and over the last couple of years many of the papers presented at the conference covered optical discs. The idea behind the Forum was to provide a neutral meeting place for information publishers, hardware and software vendors, and systems integrators.

The first meeting took place in Luxembourg on January 22, 1986, with over 70 delegates in attendance. Advisory and Technical Committees were set up and, following discussions with the commission of the European Community, Directorate General XIII, a contract to carry out a survey of standardization efforts in the USA was commissioned. A second meeting of the Forum took place in May to discuss the High Sierra Group's recommendations. John Preston from Philips presented a paper on the relationship between Compact Disc-Digital Audio, CD-ROM and CD-I.

No further meetings of the Forum are planned at present. Copies of the report and a transcript of the first and second meeting are available from Learned Information Ltd., Woodside, Hinksey Hill, Oxford. OX1 5A0, U.K.

COMPACT DISC MARKET GROWING IN THE UK

Figures released by the British Phonographic Industry in August indicate that deliveries of Compact Disc-Digital Audio discs will reach 6 million units by the end of 1986. For the first six months of this year compact discs accounted for 11% of the turnover of the UK industry, and 6% of all long-play shipments. Compared with the period April-June 1985, shipments for the same period in 1986 were up by over 160%.

British Phonographic Industry is located at Roxburgh House, 273/287 Regent Street, London WIR 7PB.

HIGH SIERRA GROUP *(continued from page 3)*

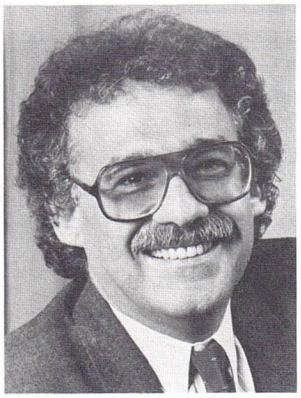
The High Sierra Group submission is a key event in the evolution of compatibility between CD-I and CD-ROM. Vendors like Reference Technology, the Boulder, Colorado systems house, are already plunging ahead with systems based on the High Sierra submission to NISO and ECMA. Publishers with an eye on both markets can now move ahead without undue worry that incompatibility between the two sister technologies could sabotage their product development efforts. The High Sierra submission is a strong sign that now is the time for publishers, in particular, to move forward. We will inform you of the impact of this standard in a forthcoming issue.

INTERVIEW

EMIEL PETRONE

VICE PRESIDENT, MARKETING AND PUBLIC RELATIONS AMERICAN INTERACTIVE MEDIA, INC.

Interviewed by David Rosen and Michael Conniff



"CD-I represents the ultimate Compact Disc system."

LINK: Let's talk about CD-I software. You are vice president of marketing and public relations for American Interactive Media, or AIM. What is AIM doing now to create the software that will drive the CD-I market forward?

PETRONE: American Interactive Media, or AIM, is the company established by Compact Disc pioneers Philips International B.V. and PolyGram to spearhead the development of CD-I software in the United States. Our principal strategy is to form joint ventures with established content providers, and we currently have more than 50 such ventures committed or in negotiation. The industries we are working with run the gamut from computer software and print publishing to broadcasting and entertainment. In the short term, AIM is working with major companies that are technologically ready and have substantial catalogs of existing titles that can be readily converted and enhanced for the CD-I format. By virtue of our direct relationship to Philips, we are equipped to provide our joint venture partners with technological expertise. We are creating the authoring guidelines and will have the first CD-I studio. We can guarantee production through Philips & DuPont Optics, or PDO, and worldwide distribution through PolyGram.

LINK: What should a publisher or entertainment company, or any other company with material that might be appropriate for CD-I do right now? When you are trying to get them to join you in a joint venture, what do you say to them?

EP: We encourage prospective joint venture partners to assess their library of existing material first to determine what could be most readily converted to the CD-I format. Material that has heretofore been packaged and marketed in companion media, such as books and records for example, may be ideally suited for CD-I. And we suggest ways such materials may be enhanced to take advantage of the interactive nature of the CD-I format. For example, let's say we wanted to put the entire life story of Frank Sinatra on a CD-I disc. We could include text and photos chronicling his entire career, along with excerpts of his recordings and record cover art, in an encyclopedic fashion. The user could experience the program either chronologically or in any sequence he or she chooses.

LINK: Leveraging the existing base of CD-Digital Audio repertoire is going to be very important to the kinds of products you'll have on CD-I.

EP: Yes, but the ability to incorporate visual and text information vastly expands the programming possibilities.

LINK: We've heard CD-I described as a "talking book." Could you explain what that means?

EP: Books communicate information in the form of text and visuals or pictures. A CD-I "book" will include these elements plus sound. You'll be able to read about the tiger, see the tiger in action, and hear the tiger. And you'll be able to hear a narrator describe the tiger. You can choose to experience these things all simultaneously, or in any combination or sequence: It's the characteristic of interactivity that makes CD-I so revolutionary as a consumer medium.

LINK: Why do you believe CD-I will follow upon the success of CD-Digital Audio? What is it about CD-I that makes you feel that way?

EP: CD-I represents the ultimate Compact Disc system and, as such, should benefit from the high level of consumer awareness and acceptance enjoyed by CD-Digital Audio, especially because CD-I players will be able to

play CD Digital Audio discs as well. As with CD Digital Audio, the CD-I system will embody the characteristics of quality, durability and ease of use.

LINK: You've also said that CD-I is going to be a replacement market for the current generation of CD-Digital Audio players.

EP: Yes, in the sense that we believe consumers who now own CD-Digital Audio systems may be the first to recognize the desirability of upgrading to a CD-I system. But the CD-I system will not make either CD digital audio software or hardware obsolete. On the contrary, the CD-I system has been specifically designed to be upwardly compatible with CD-Digital Audio.

LINK: If I owned 10 audio Compact Discs of various musical artists, would I be able to play them on my CD-I player?

EP: Absolutely.

LINK: Do you think audiophiles may be the first group to commit to CD-I?

EP: Not necessarily. Don't forget that CD-Digital Audio is rapidly penetrating the mass market. Our approach to marketing the CD-I system will be to address the mass market and various niche markets. The software applications will appeal to a far broader audience than CD-Digital Audio did initially.

LINK: LaserVision, Philips' videodisc product, is just now taking hold in institutional and educational markets but had some difficulty in its introduction in the consumer market. What is it about CD-I that makes you confident it won't encounter the same difficulties?

"Our ultimate goal is to have the family of compatible optical disc systems created principally for the consumer market."

EP: LaserVision did not succeed in the consumer market initially because it had to compete with other incompatible videodisc systems. This served to fragment the market and create confusion and indecision on the part of software companies and consumers. We eliminated these problems upfront with CD-Digital Audio by convincing the world consumer electronics industry to adopt the CD-Digital Audio system as the universal standard. Standardization paved the way for the recording industry to commit their catalog to the new format. CD-Digital Audio was introduced to the market as a system with both hardware and software available simultaneously. This is what we intend to do with CD-I.

LINK: Philips has many things going on in optical media in the home market. How does CD-I fit into the larger Philips strategy?

EP: As I said before, CD-I represents the ultimate Compact Disc system, capable of playing not only CD-I discs but also CD-Digital Audio discs and CD-ROM discs that conform to the standard agreed to by the High Sierra Group. CD-I technology will also be merged with LaserVision in the Omni Player now under development. Our ultimate goal is to have a family of compatible optical disc systems created principally for the mass consumer market.

LINK: What makes you believe consumers are going to be sold on interactivity?

EP: We believe consumers are already sold on interactivity, albeit in relatively crude forms. Look at the emphasis on programmability and remote control in other consumer electronic products such as CD-Digital Audio and home video. CD-I will enable the consumer to take command of the software and actively control the experience.

LINK: When will I be able to buy a CD-I player and how much is it going to cost me?

EP: The first generation of CD-I players may retail for about $1,500. Software prices will vary greatly, depending on the complexity of the program, roughly from $19 to $60 per disc. We expect to be ready to introduce the CD-I system in the United States by the end of 1987.

LINK: How soon can we expect prices for CD-I systems to decline?

EP: As you know, price is directly related to volume, and, as the market expands, hardware manufacturers will be able to realize economies of scale. I think it is too early to speculate on pricing. Rather, we must concern ourselves with the development of a broad catalog of CD-I software that will help launch the system and ensure its success.

THE DIFFERENCES BETWEEN CD-I AND CD-ROM

(continued from page 1)

Ask a dozen people for the differences, and you'll get three dozen answers, just as we did during the recent Information Industry Association CD-ROM conference in Palo Alto.

One of the primary reasons for the initial confusion dates back to the seminal Microsoft CD-ROM conference in Seattle last March. Much of the early enthusiasm about Compact Disc technology came because the general populace in many different industries was intrigued with the idea of multimedia consumer applications. They thought of these applications as "CD-ROM."

Exhibit A: The foreword to Microsoft Press's CD-ROM -- The New Papyrus, provided by Microsoft Chairman William Gates, and written before the CD-I announcement:

It is essential from the outset that we in the industry are careful not to label this a computer. It simply isn't one, any more than your VCR, dishwasher, and telephone are computers. From the consumer's standpoint, the viewer will consist of a CD-ROM player, a screen, and a pointing device -- that's all.

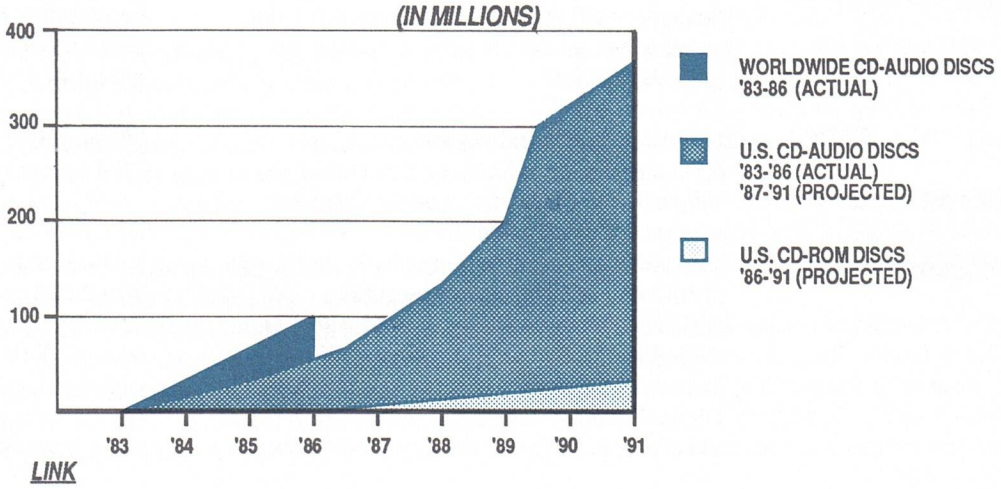
[Gates is obviously referring here to CD-I.] *The pointing device will allow a person to select information of interest, display images and text, and play the sound contained on the Compact Disc inserted in the player. Unlike the CD-ROM players connected to personal computers, these viewers will probably be portable and have a flat screen.*

CD-ROM will proliferate in two ways: as a peripheral to existing personal computers and as the heart of a new [CD-I] "viewer" device which will be more similar to the stereo or television you have in your home than to a computer.

In other words, Gates was writing about CD-I before it became a known public entity -- this in a book ostensibly about CD-ROM. But he also made what Philips officials might now regard as an inadvertent mispositioning: He positioned CD-I as a sub-set of CD-ROM. And Philips inadvertently (perhaps unavoidably) exacerbated that problem by announcing CD-I at the Microsoft CD-ROM conference.

Philips clearly sees CD-I as an extension of their consumer success in Compact Disc-Digital Audio. Or, as Stan Cornyn of The

CD-DIGITAL AUDIO vs. CD-ROM DISC SHIPMENTS



"The Compact Disc stands at a crossroads. One road leads to CD-ROM as a computer peripheral. The other road leads to a world-standard appliance combining audio, video, and interactivity."

Record Group, a CD-I programming house, put it a few years ago, when he was still a senior vice president at Warner Communications:

The Compact Disc stands at a crossroads. One road leads to CD-ROM as a computer peripheral, useful for a few encyclopedias on a variety of computers. The other road leads to a world-standard appliance, one that combines audio, video, and interactivity in most friendly and economic ways.

Is the distinction of CD parentage important? Absolutely. Stan Cornyn logged tens of thousands of miles worldwide presenting his personal view that CD-Audio "Red Book" graphics specifications didn't go far enough; a new worldwide standard was essential, one that would harness the "interactive" potential of audio, video, data, text, and graphics.

Nor was Cornyn happy about the CD-ROM "Yellow Book" specifications which allowed proprietary and self-excluding systems to grow unchecked. (A problem now addressed and, in large part, answered by the High Sierra Group. See the story in this issue of CD-I News.)

Instead, Philips and Sony worked successfully for a "Green Book" -- a separate standard, potentially compatible with CD-ROM players, and one that would include both hardware and software specifications, was developed for CD-Digital Audio.

The Philips/Sony CD-I announcement opened the door to the kind of multimedia applications many attending the Microsoft conference assumed would ultimately fall under the CD-ROM banner. Rather than let the marketplace decide file formats and other specifictions, the CD-I specifications define how data for video, graphics, sound, and text will be encoded on the disc.

The CD-I specifications allow for the manufacturing of a single, self-contained "system," including the utilization of the Motorola 68000-processor family and an operating system -- Compact Disc Real Time Operating System (CD-RTOS) -- based on the OS-9 system developed by Microware of Des Moines, Iowa. The OS-9 operating system was chosen for the CD-I specification because it was designed to handle switching datastreams between audio and video microprocessors on a real-time interactive basis.

One key advantage of OS-9 is its highly portable Unix-type environment. The clear emphasis is on real-time audio/visual applications: CD-I is six times more efficient for video data storage than CD-ROM due to the inclusion of a special video processor; the standard also provides for high resolution digital television modes soon to be available in the consumer marketplace as well as compatibility with TV standards worldwide -- NTSC, PAL, and SECAM -- by processing video signals on a so-called R.G.B., or Red-Green-Blue basis.

Using compression techniques suitable for animation, CD-I is also able to handle moving graphics to produce a full-motion animation effect.

On the audio side of CD-I, Philips and Sony expect the technology will "piggyback" on the success of CD-Audio. The technology allows for the high-fidelity of CD-Digital Audio, a level of fidelity equivalent to FM broadcast and "Speech Mode," analogous to AM broadcast or "better-than-telephone" conversation quality. The lower the fidelity the more audio that can be stored on a disc -- up to 16 hours of audio programming (complemented by images) of "speech" quality sound. Further compression will be made possible by the computer-generation of phonetic speech directly from data on the CD-I disc.

Philips and Sony position CD-I as a direct and important descendant of Compact Disc-Digital Audio. When they talk of CD-I software, they speak of "programming" and "hit discs." By insisting, against all evidence, that CD-I is simply a piece of CD-ROM, some companies have merely confused the issue and done a disservice to all the industries concerned.

--Michael Andrew Conniff

THE EVOLUTION OF COMPACT-DISC INTERACTIVE FROM CD-AUDIO TO CD-I

The promise of multimedia consumer applications in the home -- combining video, audio, text, graphics, and computer programs-- has fascinated planners and dreamers for decades. Compact Disc-Interactive is one of the first manifestations of that promise, an ambitious attempt to build upon one of the most spectacular successes in the history of consumer electronics, Compact Disc-Digital Audio.

In the beginning there was the laser. In 1969, Philips undertook three separate research projects to capitalize on the promise of laser and optical storage technologies -- one in video, another in audio, with both concentrating on optical media as a distribution vehicle. The third was for write-once data collection and archival purposes, utilizing graphics, text, and data.

By 1973, these projects had begun to bear fruit. The optical disc format for video programming became known as LaserVision. Philips began to master discs for industrial applications two years later, and the system was formally launched in 1978. That same year, just as LaserVision was being introduced to the market, Philips defined the fundamental parameters of the Compact Disc-Digital Audio system.

In 1979, the press got its first chance to look at a Philips Compact Disc-Audio player, and Philips and Sony signed an agreement to establish the Philips format as a world standard-- an effort which has been successful.

The third Philips research project -- the development of optical storage technology to record and store data -- was also proceeding at a rapid pace. The Digital Optical Recording (DOR) system was an "ultra high-capacity mass storage system in which data, once written, is non-erasable." Unlike the video and audio research programs, designed to distribute programming, DOR was designed for the onsite write-once "capture of computer data."

Commenting on CD-I's evolution, **D. C. Geest, Senior Managing Director & Chairman, Philips International B.V., Corporate Group Home Interactive Systems,** explains:

CD-I...is a logical evolution of Compact Disc-Digital Audio. It is therefore firmly based on the well-known and universally accepted Compact Disc standard, which is such a spectacular success in the consumer market.

I would like to emphasize that CD-I is specifically oriented towards consumer and institutional applications. The specifications aim at meeting all requirements in electronic publishing, in the wide areas of entertainment, education, "edutainment," and tools for use in work and study (often referred to as "personal productivity"). These specifications for CD-I define a media standard that is driven mainly by video and audio information and is linked to text, data, and computer programs.

We are now at a pivotal time in the evolution of CD-I. Will it stumble in the consumer market, like LaserVision, which suffered from competing videodisc formats and the introduction of the "write/read" videodisc player? Or will the model of its market introduction move closer to the widespread acceptance of Compact Disc-Audio?

Like any evolutionary species, the success of Compact Disc-Interactive will be tied to the survival of the fittest in the marketplace. At first, driven by the optical technologists, it must now respond to the whims of consumers to vindicate the original digital visions of the dreamers. The standardized CD-I hardware and software specification -- and the success of its precursor, Compact Disc-Digital Audio -- gives CD-I an evolutionary advantage in the consumer marketplace.

"The success of Compact Disc-Interactive will be tied to the survival of the fittest in the marketplace."

INDUSTRY UPDATE

WNET'S "REAL, DOWN TO EARTH CD-I PRODUCT"

"The real trick with CD-I is that there's a lot of smoke and not a lot of fire."

Multimedia programming expertise -- the kind of recombinant audio, video, and software flair Compact Disc-Interactive requires -- is rarely found in one company. Fortunately for this fledgling industry, public television stations in the United States may turn out to be fertile ground for multimedia skills. One of the first public TV initiatives in CD-I is a physics CD-I product developed by WNET TV in New York City.

WNET has been fascinated with multimedia applications since the early days of the videodisc. The early marketplace disappointment in that technology in the consumer market forced the station back into a planning mode -- a process that began to identify CD-I type programming possibilities long before the announcement of the CD-I standard.

Stephen Salyer, WNET's Senior Vice President, Marketing and Communications:

We had been 'milling around' after the videodisc had trouble finding its way in the marketplace. We had some notions of the compact disc as a [multimedia] standard. The [Philips/Sony] announcement gave us an opportunity and a reason to get active again. We saw the momentum behind the standard in the consumer marketplace.

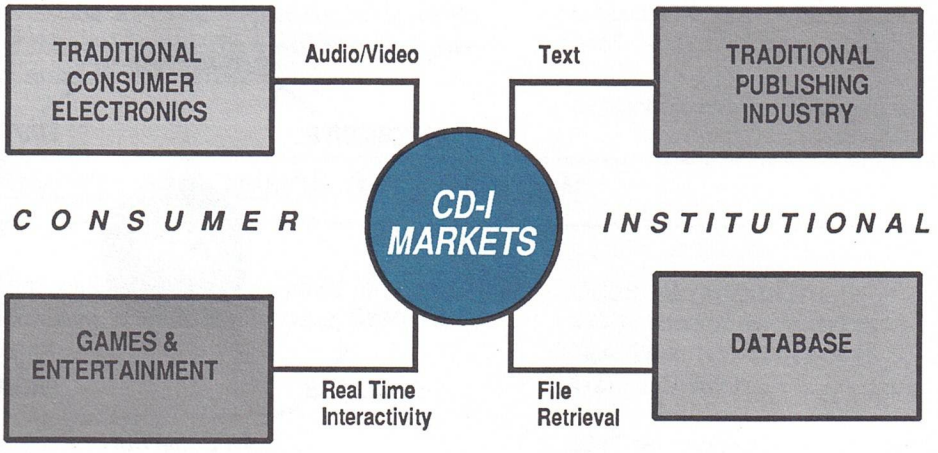
WNET is one of the few companies out there that has both an editorial stream of expertise and audio/video print resources. The real trick with CD-I is that there's a lot of smoke and not a lot of fire. You have to understand the trade-offs in the CD-I specs, and to utilize software differently than with linear formats.

We've been working for six months on a project financed by the Corporation for Public Broadcasting in the area of physics. We'd been playing around with some CD-I notions, with some characteristics of CD-I, before the announcement of the standard. Now we have a prototype completed. It's not a completed product -- it has some demo properties -- but it is a real, honest-to-God CD-I product. We'll be issuing a report on it soon.

Salyer said WNET has also taken advantage of the services of two consultants: Tom Anderson of Commonwealth Strategies in Boston, on the business side; and Hugh Osborn, a consultant working as a producer/designer. CD-I News will keep close track of this intriguing programming development in future issues.

The activity at WNET should dissuade some skeptics from writing off CD-I in the days of disbelief before software or product is widely available. It also gives some indication that the complex mix of programming skills necessary for CD-I success does indeed exist.

CD-I: A SINGLE, STANDARDIZED TOTAL APPROACH



APPLICATIONS UPDATE

WHAT'S THE RECORD GROUP REALLY UP TO? A DISCOGRAPHY

The Record Group (TRG), led by former Warner Communications Senior Vice President Stan Cornyn, and funded by N.V. Philips, has a simple charter: to develop original Compact Disc-Interactive programming.

"Our mission is to create original programs."

As Cornyn says, "We're not in the business of buying [the rights to] Gone With The Wind. Our mission is to create original programs."

Following, is a brief status report on four discs-in-the-making at TRG, with comments from Cornyn. Note the new language of CD-I production: Cornyn's use of "line producer," "dramatization," together with terms like "real-time scripts" and "interactive fiction."

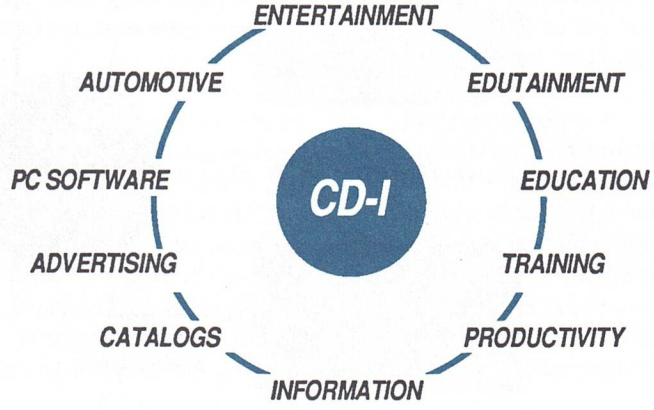
- "London: Anyway You Turn"
  Pretty far along. The structure's outlined. The writing's underway. Videodisc travelogues have been attempted before; the CD-I twist with 'Anyway You Turn' is a fourth-dimension. You can change centuries with a flick of the mouse, your way through the times of Chaucer and Shakespeare. You can walk through London in eight different time eras.

- "The Time Machine"
  Producers are knocking it together. Maps are being drawn now -- there will be over 250 maps. Historical accuracy-checking is being done by UCLA [University of California at Los Angeles] history professors. It will trace the history of civilization from the year 700 B.C. forward. 'Dramatization' is underway now. Jan Sircus is the line producer.

- "Danger in Dreamland"
  Pencil storyboards have been done. The artistic look is known. We should have a script very soon. Performers and writers are from the Firesign Theater. The senior producer is Marc Blank, founder of InfoCom and the creator of 'Zork,' the computer game. I call it interactive fiction. It's like going to a movie with a steering wheel.

- Classical Music Disc (untitled as yet)
  We are transferring academic manuscript articles to real-time scripts. We are gathering the pictures -- there will be more than 2,000. We're trying to create a living, real-time experience. This will go beyond 'Grove's Dictionary of Music.' The idea is to take an encyclopedia and make it come alive in CD-I. Musicians will demonstrate instruments; terms like 'andante' will be clarified by listening to their meaning. The disc will cover music from the Renaissance to Philip Glass.

CD-I: MULTI-APPLICATION DELIVERY CHANNEL



LINK

THE GREEN BOOK
HOW TO OBTAIN THE CD-INTERACTIVE SPECIFICATION

There have been many requests for detailed technical information on Compact Disc-Interactive, also known as the "Green Book."

Should you wish to obtain such information, please write to the address given below, stating whether you wish to have details for the actual production of CD-I players; or for the manufacture of discs; or for the provision of studio or other support services; or, finally, if you only wish to receive general information at this stage. The associated fees for information and the right to produce either players or discs, will vary depending upon the kind of information requested. Information may be requested from:

Mr. John Preston, Manager
New Media Information Center
Philips International B.V.
Corporate Group-Home Interactive Systems
Bldg. HWD-2, P.O. Box 218
5600 MD Eindhoven Holland
Telephone: (31) - (40) -756-374 or -757-016
Telex: 35000 phtc nl/routing NLMTFBI
Telefax: (31) - (40) -757-043

PLACES TO BE...

(continued from page 16)

MICROSOFT'S SECOND INTERNATIONAL CONFERENCE ON CD-ROM TECHNOLOGY

March 3-5, 1987

Seattle Sheraton
Seattle, Washington

This conference "will focus on product development, application design, and publishing" in CD-ROM.

Microsoft
16011 N.E. 36th Way
Box 97017
Redmond, Washington 98073
(206) 882-8080

OPTICA 87 -- THE INTERNATIONAL MEETING FOR OPTICAL PUBLISHING AND STORAGE

April 14-16, 1987.

RAI Centre
Amsterdam

This is a new conference, being spun off by Learned Information from the existing optical publishing activities. Papers are being sought for the conference which will have also have an associated exhibition.

Learned Information, Ltd.
Woodside Hinksey Hill
Oxford, OX1 SA0, UK
0865-730275

Contact directly for price quote.

CD-I: THE FUTURE -- BUSINESS CONFERENCE AND EXHIBITION

May 11-13, 1987

Moscone Center
San Francisco

First conference to address broad range of CD- I marketing, product development, and technical issues.

Online International Inc.
989 Avenue of the Americas
New York, NY 10018-5485
1-212-279-8890

$845 per person

PLACES TO BE...

INFORMATION INDUSTRY ASSOCIATION -- 18TH ANNUAL CONVENTION AND EXHIBITION

November 9-12, 1986

Marriott Marquis
New York City

"Over 1,000 senior-level information executives are expected to attend this conference to explore the present and future direction of this industry." Sessions include "Translating Optical Publishing to Products and Profits."

Information Industry Association
555 New Jersey Avenue, NW
Suite 800
Washington, DC 20001
1-202-639-8262

$645 for IIA members; $845 for non-members.

TENTH INTERNATIONAL ONLINE INFORMATION MEETING

December 4, 1986

Novotel Hotel,
London

This leading online database conference in Europe has seen a rapid increase in both papers and exhibitors on CD-ROM. Optical disc publishing will be a major feature of this year's event.

Address and price quote not available at this time.

OPTICAL INFORMATION SYSTEMS '86

December 9-11, 1986

Hyatt Regency
Arlington, Virginia

This conference will cover a wide range of optical technologies, including CD-I, CD-ROM, write-once discs, digital videodiscs, and erasable discs.

Conference Management Corporation
200 Connecticut Avenue, P.O. Box 4990
Norwalk, CT 06856
(203) 852-0500

$495 before November 7; $595 after.

INFORMATION INDUSTRY ASSOCIATION -- ANNUAL HIGH TECH MARKETING CONFERENCE

February 12 -14, 1987

Boca Raton Hotel
Boca Raton, Florida

This conference will focus on innovation in technology for the mass market. The keynote dinner address will be delivered by the master strategist of CD-I, David Geest, senior managing director and chairman, Philips Intl. Corporate Group-Home Interactive Systems.

Information Industry Association
555 New Jersey Avenue, N.W.
Suite 800
Washington, D.C. 20001
1-202-639-8262

$345 for IIA members; $445 for non-members.

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